

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 10/631,804

**AMENDMENTS TO THE CLAIMS**

**This listing of claims will replace all prior versions and listings of claims in the application:**

**LISTING OF CLAIMS:**

1. (currently amended): An IC package comprising:

an IC chip;

a substrate including a conductive layer; [[and]]

a heat-radiating mechanism that is mounted on the substrate, disposed between the IC chip and the substrate, and dissipates heat of the IC chip; and

an insulating layer between the heat-radiating mechanism and the conductive layer of the substrate,

wherein the heat-radiating mechanism and the conductive layer of the substrate are electrically connected via connection members disposed in plural through-holes disposed in the insulating layer, and

wherein terminals of the IC chip and the heat-radiating mechanism are electrically connected, ~~and the heat radiating mechanism and the conductive layer of the substrate are electrically connected.~~

2. (original): The IC package of claim 1, wherein the IC chip is fixed on the heat-radiating mechanism.

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 10/631,804

3. (original): The IC package of claim 1, wherein the IC chip and the heat-radiating mechanism are electrically connected by wire bonding.

4. (original): The IC package of claim 1, wherein the IC chip and the heat-radiating mechanism are electrically connected by a conductive material.

5. (canceled).

6. (original): The IC package of claim 1, wherein the terminals of the IC chip are ground terminals and the conductive layer is a ground layer.

7. (original): The IC package of claim 1, wherein the terminals of the IC chip are power terminals and the conductive layer is a power layer.

8. (original): The IC package of claim 1, wherein the heat-radiating mechanism comprises a heat sink.

9. (currently amended): [[The]] An IC package of claim 1, comprising:

an IC chip;

a substrate including a conductive layer; and

a heat-radiating mechanism that is mounted on the substrate, disposed between the IC chip and the substrate, and dissipates heat of the IC chip,

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 10/631,804

wherein the heat-radiating mechanism comprises plural heat sinks, and at least part of each heat sink is disposed below the IC chip, and

wherein terminals of the IC chip and the heat-radiating mechanism are electrically connected, and the heat-radiating mechanism and the conductive layer of the substrate are electrically connected.

10. (original): The IC package of claim 9, wherein the plural heat sinks are disposed so as to be separate from each other.

11. (currently amended): A connection structure comprising:

an IC chip;

a substrate disposed with a conductive layer; [[and]]

a heat-radiating mechanism that is mounted on the substrate, disposed between the IC chip and the substrate, and dissipates heat of the IC chip; and

an insulating layer between the heat-radiating mechanism and the conductive layer of the substrate,

wherein the heat-radiating mechanism and the conductive layer of the substrate are electrically connected via connection members disposed in plural through-holes disposed in the insulating layer, and

wherein terminals of the IC chip are electrically connected to the conductive layer via the heat-radiating mechanism.

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 10/631,804

12. (original): The connection structure of claim 11, wherein the IC chip and the heat-radiating mechanism are electrically connected by wire bonding.

13. (original): The connection structure of claim 11, wherein the IC chip and the heat-radiating mechanism are electrically connected by a conductive material.

14. (canceled).

15. (original): A method of connecting an IC chip and a substrate including a conductive layer sandwiched between insulating layers, the method comprising the steps of:

- (a) disposing a heat-radiating mechanism between the IC chip and the substrate;
- (b) fixing the IC chip to the heat-radiating mechanism;
- (c) disposing plural through-holes in at least one of the insulating layers; and
- (d) disposing connection members in the through-holes so that the heat-radiating mechanism and the conductive layer of the substrate are electrically connected via the connection members.

16. (currently amended): An electrical device disposed with an IC package that includes:

- an IC chip;
- a substrate including a conductive layer; [[and]]
- a heat-radiating mechanism that is mounted on the substrate, disposed between the IC chip and the substrate, and dissipates heat of the IC chip; and

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 10/631,804

an insulating layer between the heat-radiating mechanism and the conductive layer of the substrate,

wherein the heat-radiating mechanism and the conductive layer of the substrate are electrically connected via connection members disposed in plural through-holes disposed in the insulating layer, and

wherein terminals of the IC chip and the heat-radiating mechanism are electrically connected, ~~and the heat radiating mechanism and the conductive layer of the substrate are electrically connected.~~

17. (currently amended): An electrical device disposed with a connection structure that includes:

an IC chip;  
a substrate disposed with a conductive layer; and  
a heat-radiating mechanism that is mounted on the substrate, disposed between the IC chip and the substrate, and dissipates heat of the IC chip; and

an insulating layer between the heat-radiating mechanism and the conductive layer of the substrate,

wherein the heat-radiating mechanism and the conductive layer of the substrate are electrically connected via connection members disposed in plural through-holes disposed in the insulating layer, and

wherein terminals of the IC chip are electrically connected to the conductive layer via the heat-radiating mechanism.

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 10/631,804

18. (new): The IC package of claim 9, wherein the IC chip is fixed on the heat-radiating mechanism.

19. (new): The IC package of claim 9, wherein the IC chip and the heat-radiating mechanism are electrically connected by wire bonding.

20. (new): The IC package of claim 9, wherein the IC chip and the heat-radiating mechanism are electrically connected by a conductive material.

21. (new): The IC package of claim 9, further including an insulating layer between the heat-radiating mechanism and the conductive layer of the substrate, wherein the heat-radiating mechanism and the conductive layer of the substrate are electrically connected via connection members disposed in plural through-holes disposed in the insulating layer.

22. (new): The IC package of claim 9, wherein said conductive layer is a ground layer, a first of said plural heat sinks being electrically connected to the ground layer, and at least a first of the terminals of the IC chip being a ground terminal electrically connected to said first of said plural heat sinks; and

wherein said substrate includes another conductive layer, said another conductive layer being a power layer, a second of said plural heat sinks being electrically connected to the power layer, and at least a second of the terminals of the IC chip being a power terminal electrically connected to said second of said plural heat sinks.

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 10/631,804

23. (new): The IC package of claim 10, further including an insulating layer between the heat-radiating mechanism and the conductive layers of the substrate, wherein said first of said plural heat sinks and the ground layer are electrically connected via a first set of connection members disposed in plural through holes disposed in insulating layer, and wherein said second of said plural heat sinks and the power layer are electrically connected via a second set of connection members disposed in plural through holes disposed in insulating layer.

24. (new) An electrical device disposed with an IC package that includes:

- an IC chip;
- a substrate including a conductive layer; and
- a heat-radiating mechanism that is mounted on the substrate, disposed between the IC chip and the substrate, and dissipates heat of the IC chip,
  - wherein the heat-radiating mechanism comprises plural heat sinks, and at least part of each heat sink is disposed below the IC chip, and
    - wherein terminals of the IC chip and the heat-radiating mechanism are electrically connected, and the heat-radiating mechanism and the conductive layer of the substrate are electrically connected.